Saima Naureen

Kay Jeffrey

Prof. O’Connor-Petruso

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Wiki Assignment #7 - Annotated Bibliography

Poon, C., Tan, D., & Tan, A. (2009). Classroom management and inquiry-based learning: finding the balance. *Science Scope,* *32 (9),* 18-21. (EJ850038). Retrieved from

<http://vnweb.hwwilsonweb.com.ez-proxy.brooklyn.cuny.edu:2048/hww/results/external_link_maincontentframe.jhtml?_DARGS=/hww/results/results_common.jhtml.43>

This article is based upon an observation of a sixth grade science class for over three semesters. The article explains how an elementary grade teacher used seven successful strategies to organize her classroom as she shifted from more traditional instructions to inquiry-based. The classroom management strategies for inquiry-based learning involved curriculum and instruction as well as classroom organization.

Curriculum and instructions were changed as the teacher included the use of hands-on investigative activities, use of science journals, use of group-based activities, and guided students to reflect on their learning process. The teacher changed the classroom organization by organizing resources for investigative activities, by developing a seating arrangement, and by managing transitions and gaining attention.

Hohloch, J. M., Grove, N., & Bretz, S. L. (2007). Pre-service teacher as researcher: the value of inquiry in learning science. *Journal of Chemical Education, 84 (9),* 1530-1534. (EJ820789). Retrieved from

<http://jchemed.chem.wisc.edu.ez-proxy.brooklyn.cuny.edu:2048/Journal/Issues/2007/Sep/abs1530.html>

This article described the reform of a chemistry course required of elementary and middle school teachers. This course gave the opportunity to a pre-service teacher as she did action research and developed more hands-on activities. She conducted her activities with the college students in her chemistry class. This project gave her better understanding of how to link science experiments to everyday life. By doing this project at college level gave this pre-service teacher more confidence to use hands-on and inquiry-based activities in her science classroom.

Al-Sabbagh, S. (2009). Instruments and implements of enquiry based learning. *Online Submission*, Retrieved from ERIC database.

<http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED507027&site=ehost-live>

This article explains in detail the definition of Enquiry-based learning, how to create an Enquiry-based learning environment, and how to sustain that learning environment. This paper is intended to help teachers and school leaders by exploring some important factors of Enquiry-based learning. The information in this article is the end result of a literature review of many publications on the topic of Enquiry-based learning.

Qablan, A., Al-Ruz, J., Theodora, D., & Al-Momani, I. (2009). "I know it's so good, but I prefer not to use it." An interpretive investigation of Jordanian preservice elementary teachers' perspectives about learning biology through Inquiry. *International Journal of Teaching and Learning in Higher Education*, *20 (3),* 394-404. (EJ869324). Retrieved from ERIC database.

<http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ869324&site=ehost-live>

This article is based upon a study on pre-service elementary biology teachers. Findings of this study suggest that most of the pre-service teachers supported the inquiry-based learning strategy. It is indicated that the teachers tend to teach the way they were taught for their undergrad courses. The article recommended that pre-service teachers should be offered inquiry-based courses so they can teach and support the same strategy in their classroom as they start working as teachers.

Marshall, J. A., & Dorward, J. T. (2000). Inquiry experiences as a lecture supplement for preservice elementary teachers and general education students. *American Association of Physics Teachers, 68.* Retrieved from <http://ejournals.ebsco.com/direct.asp?ArticleID=E7VEHHT4H1RP07MNC39C>.

This journal article is based on a study carried out on science students who it is expected will go on to teach science the same way that they have been taught. It focuses on substantiating the findings of pervious research that supported inquiry based learning in science. In this research, students were divided into two groups (the “inquiry” and “non-inquiry” groups). The experiment carried out to determine whether inquiry activities as a supplement to a curriculum based on a traditional lecture curriculum would improve student achievement.

Oliveria, A. W. (2009). ‘‘Kindergarten, can I have your eyes and ears?’’ politeness and teacher directive choices in inquiry-based science classrooms. *Cultural study of science education, 4,* 803-846. DOI 10.1007/s11422-009-9193-6.

This journal article focuses on a study carried on elementary teachers to determine the extent of their social understanding and employment of directives as the facilitators of their inquiry based science classes. It was discovered that many of them experienced interactional difficulty with their students, which is common in an inquiry based learning environment. Oliveria, A. W. (2009) posits that this is an indication that many science teachers are unprepared for the social demands of this type of strategy. The teachers participated in a summer activity where they were exposed to literature and discussion to foster their awareness of effective methods of using directives to regulate student behavior. The participants later demonstrated the ability to use directives in a more polite form, thus being able to strategically share authority with their students. Even as the teachers gained awareness, they did not relinquish their authority. It is felt therefore that the need to strengthen their awareness in the type of language and directives to be used with an inquiry based science teaching/learning strategy.

Vandervoort, F. S. (1983). What would John Dewey say about science teaching today? *The American Biology Teacher, 45 (1),* 38-41. Retrieved from JSTOR.

This article is about the teaching practices that were used in America during the late 19th and early 20th centuries. Dewey was disturbed to see rote memorization and mechanical routine practices in science classrooms. Dewey believed that inquiry-based scientific approach could improve education. So, to test his theory he established an experimental elementary school, the Laboratory School of the University of Chicago. He let children use their natural activity and curiosity to deal with problems. By putting his theory into practice, Dewey proved his strong belief in the use of inquiry for science teaching.

Glassman, M. (2001). Dewey and Vygotsky: society, experience, and inquiry in educational practice. *Educational Researcher, 30 (4),* 3-14. Retrieved from JSTOR.

This article compares two education theorists John Dewey and L.S. Vygotsky on three key points related to educational processes and goals. First, the two theorists are compared on the role of social history and the tools it produces. Second, they are compared in their conceptualization of experience and culture. Third, the two theorists are compared on their perspectives on human inquiry. Dewey believes that the child can learn best through inquiry-based teaching where the child can follow his/her own interest. Vygotsky suggests that the mentor should have greater control who should lead the child in accomplishing the task.

Chiapetta, E. L. & Collette, A. T. (1973). Process versus content in elementary science teaching. Retrieved from <http://web.ebscohost.com/ehost/detail?vid=6&hid=113&sid=d94660d3-c320-48ca-8b62-8ca6697c1c37%40sessionmgr112&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=eric&AN=ED099196>

In this journal, the author discusses the many reasons why the use of the process (inquiry) method instead of direct instruction (content) method of teaching science in the elementary schools should be emphasized. The author examines the history of teaching science in the elementary schools in the United States of America, cognitive development and what preparation of teachers would entail. This research shows that it is better to train teachers to use a “process-oriented” curriculum because it does not require the teacher to have any major understanding of scientific principles.

Past history of teaching science provides evidence that tells that the Nature Study movement which started in the late 1800’s used terms such as doing, observing and inducing. This led to educators placing emphasis on problem solving up to 1960 even though most curricula were subject matter oriented. Elementary science in the 1920’s and 1930’s stressed both the process and the content with the emphasis being placed on teaching the scientific method and mastery of facts. The results of this study indicate that educators regard the development of competence in the use of the scientific method and the development of a scientific attitude as important. “Developmental psychologists such as Montessori, Piaget and Bruner believe that child cognition is enhanced when pupils use the process of science.”

Robertson, B. (2007). Getting past “inquiry versus content”. *Educational Leadership*, *64 (4),* 67-70*.* (EJ766308). Retrieved from ERIC.

The author of this journal discusses the choices which teachers can make in relation to teaching science. It is noted that teachers can use several methods of teaching science. They can place emphasis on inquiry learning and thus provide their students with ‘hands on experiences’. They can also choose to replace inquiry learning with direct instruction, thus placing emphasis on content knowledge. The research shows that using the inquiry method to teach science requires that the teacher conducts careful planning and preparation in order to have adequate content information. This would ensure that the required information is being imparted too the students. The point was made that not every science topic can be taught using the inquiry method However science teachers should make one of their strategies.

Skinner, B. F. (1987). Teaching science in high school—what is wrong. Paper presented at the AAA meeting

Skinner posits that there is an acute shortage of student entering the scientific field and the main fault probably lies with education. He claims that good teaching should give an accurate account of what science is and does and should emphasize the talents of present and future scientists in all sectors of the society. Effective teaching can create that large pool of scientists who can practice in all of our scientific institutions and also teach science in our schools.

Skinner felt that all of the other educational needs in science were being addressed except the most important educational need which is ‘a better understanding of the processes involved in learning or teaching or the possibility of improving them. He claims that teachers teach as they were taught or have seen others teach. However, in the hands of a good teacher, a new text, or materials or methods may be dramatically successful but this is not so for every teacher at large.

We should therefore design educational practices which would permit all teachers to teach well and students to learn effectively.

Skinner advocates imparting to the student the rewards gained from working long and hard even when nothing seems interesting. Even though discovery seems appropriate we cannot mean that the student should discover all of science for himself. “Science is a vast accumulation of discoveries of a great many men. It must be transmitted from one generation to another in books, charts, tables etc., but also in the behavior imparted to a new member of a culture. Education is charged with the transmission of knowledge and it cannot possible fulfill its obligation simply by arranging for rediscovery. A great deal of science content must be taught.” It is important that books and methods be updated. We must first define our goals in the most explicit way then begin to teach. We should specify the terminal student behavior then begin to generate it through programmed instruction – a contribution to education that has been widely misunderstood. The teacher should make sure the student understands one step before moving on to the other. The teacher should use the principles of operant conditioning to strengthen behaviors.

Soltis, F. (1988). Dewey and Thorndike: The persistence of paradigms in educational scholarship. *Canadian Journal of Education, 13 (1),* 39-51. Retrieved from JSTOR.

In this article, Soltis writes about how fields of philosophy and psychology have been benefiting from the work of Dewey and Thorndike. He writes that Dewey, a philosopher and Thorndike, a psychologist provided paradigmatic conceptions of how philosophy and psychology should work. Now it’s up to educators and practitioners to find similarities in their work and use it to understand the philosophy and psychology of education.

Beliavsky, N. (2006). Revisiting Vygotsky and Gardner: realizing human potential. *Journal of Aesthetic Education, 40 (2),* 1-11. Retrieved from JSTOR.

The author of this article writes about the philosophies of Vygotsky and Gardner. Vygotsky believe that teaching-learning process can not occur in isolation. The child always needs support of an adult to learn a new concept which is ahead of the child’s cognitive development. First, the adult can help the child by showing him how to solve a problem. Later, that child can solve that problem by himself as he approaches his future development. Likewise, Gardner believes that the child should get the support of an adult when learning about a new topic. However, the adult or the teacher should always teach a new topic in many different ways keeping in mind the different intelligences of the child. In this article, Beliavsky argues that by understanding Vygotsky’s idea of Zone of Proximal Development and Gardner’s theory of Multiple Intelligences, we can implement a better method of teaching and learning. Through this method of teaching, educators would be able to teach ahead of the child’s development and yet let the child to explore their personal, social and academic strengths.

Ray, W. (1961). Pupil discovery vs. direct instruction. *The Journal of Experimental Education, 29 (3),* 271-280. Retrieved from JSTOR.

In this article, the author describes his investigation as he looked at the relative effects of directed discovery method versus teacher dominated direct instruction method of teaching. Ray describes that with direct instruction; the teacher poses the problem and then solves the problem without giving any chance to the child to discover. With directed discovery method the child is given an opportunity to think about the problem and then discover the method to solve the problem. The author also writes about how many teachers believe that direct instruction is the best method of teaching slow learners. However with this research, the author found that the directed discovery method can bring satisfactory results when used with slow learners.

Henderson, T., & David, A. (2007). Integration of play, learning, and experience: what museums afford young visitors. *Early Childhood Education journal, 35 (3),* 245-251.

DOI 10.1007/s10643-007-0208-1

This journal discusses the necessity of children gaining experience through inquiry based learning. The author has used the museum as a source of knowledge. Evidence is provided to show that learning is best achieve when children have opportunities to engage in play-based inquiry. The author emphasizes the point that learning can be the process of understanding that occurs through children’s perception, encoding and retrieval of information and also the outcome of children’s observation of someone’s actions. The author quotes Dewy (1938) who posits that conventional views of learning focus on acquiring knowledge that is contained in books or in the mind of elders and for educators to possess this concept of learning is simply to see the child as passive, receptive, and absorbing in their acquisition of knowledge. The author further provides evidence to show that children’s learning is enhanced through participation and observation, which inquiry-based learning provides.

Mason, J. (1963). The direct teaching of critical thinking in grades four through six. J*ournal of Research in Science Teaching, 1 (4).* Retrieved from ERIC. <http://www.eric.ed.gov.ez-proxy.brooklyn.cuny.edu:2048/PDFS/ED011239.pdf>

In this journal, the author compares science units constructed to directly teach critical thinking with science units geared for the effective teaching of critical thinking. A wide sample of children was used for this experiment. Before the experiment began, a wide sample of teachers received in-service training which helped them to develop science lesson plans for the direct teaching of the various components of critical thinking. The basic significant assumptions required for the development of the science units were explained to teachers. These assumptions include the notion children should have planned experiences in science rather than incidental experiences; they should be exposed to direct experiences with both the content and the method of science; students should also be given direct training to acquire skills and attitudes of science and, teachers should strive for competency in subject matter and instructional techniques. This should result in the student’s enhanced scientific thinking and problem solving skills. The children were pre-tested and post-tested with unit achievement tests and a test designed to measure critical thinking skills. Only one group of students did not show significant improvement in critical thinking skills. The author therefore concluded that to teach critical thinking, direct training in the methods of science should be given.

Lawson, A., & Renner, J. (1975). Piagetian theory and biology teaching. *The American Biology Teacher, 37 (6),* 336-343.

In this article, Lawson and Renner describe Piaget’s theory of intellectual development and its importance for biology teachers. Piaget believes that as the child grows and his brain experience intellectual development he starts to construct mental structures through his interaction with the environment. Piaget also believes that these mental structures do not derive from a simple mental record of the world instead these come form a dynamic interaction of the mind and the environment. Lawson and Renner also explain that how University of California, Berkeley has developed the Science Curriculum Improvement Study based upon Piagetian theory. That procedure involves three basic components: exploration, invention, and discovery. They called it a learning cycle in which students move from one phase to the next as they learn and develop mental structures through their interaction with the environment.

Bangert-Drowns, R., & Bankert, E. (1990). Meta-analysis of effects of explicit instruction for critical thinking. Retrieved from ERIC. Accession Number: ED328614. <http://www.eric.ed.gov.ez-proxy.brooklyn.cuny.edu:2048/PDFS/ED328614.pdf>

The authors of this journal seek to examine the results of explicit instruction on thinking which was done through an experiment. The author quotes Mckeachie, Pintrich, Lin, and smith (1987) who shares the view that improvement in critical thinking can be credited to three instructional variables, namely student discussion, explicit emphasis on problem -solving procedures, and an explicit emphasis on methods to encourage development of meta-cognition. The author also discusses Nibett et. al views that the result of repeated practical experiences with situations that demand certain patterns of thinking are really abstracted patterns of well practiced cognition referred to as pragmatic reasoning schemas. These schemas can be enhanced by relatively brief, explicit instruction about the schema.

Bencze, J. (2009). ‘‘Polite directiveness’’ in science inquiry: a contradiction in terms? *Cultural Studies of Science Education, 4,* 855-864. DOI 10.1007/s11422-009-9194-5

This article examines the use of the inquiry method of teaching science as a necessity but a somewhat difficult method of teaching science in schools. It points out the difficulties faced by teachers in channeling and maintaining the interest of students as they engage themselves in inquiry activities and tries to ‘derive appropriate conclusions about nature’. The author speaks of the necessity of teachers guiding students through inquiry activities, using polite discussions.

Lee, O. (2002). Promoting scientific inquiry with elementary students from diverse cultures and languages. *Review of Research in Education, 26,* 23-69.

In this paper, the author examines multicultural students’ performance in some scientific inquiry-based classes. Many teachers discussed that some students come from home environments where questioning and inquiry were not promoted. The author describes in detail what scientific inquiry is and later suggests some instructional approaches that could help to promote it for students who come from diverse cultures and languages. The author also points out that the best approach that was used by teachers was to relate science to the student’s cultures and languages.

Wang, J., & Wen, S. (2010). Examining reflective thinking: a study of changes in methods students’ conceptions and understandings of inquiry teaching*. International Journal of Science and Mathematics Education.* 1-21. Retrieved from EBSCO. <http://ejournals.ebsco.com/direct.asp?ArticleID=4F6CBAE4E3BBD1F0DC2A>

This journal comprises of a study aimed at improving teachers understanding and correct use of the inquiry method of teaching. The authors identified three reasons that influence the teachers methods of teaching, these are: Impact of cultural myths, conditions for critical reflection and unit design as performance of understanding. An experiment was conducted on teachers in Taiwan by way of a science methods course. It provides the teacher educators with knowledge about how students expressed their understanding about inquiry teaching. The science course provided indications about appropriate teaching strategies for science method courses. The authors stressed that, ‘Teacher education programs play a role in the development of teachers\_ conceptions about teaching and learning’.

The authors questions the clarity of how the ‘experiences of a reflective approach mediates methods students conceptions of inquiry teaching and transforms those conceptions into lesson plans’. They refer to Erikson (1998) as they claim that the study adapts a case study approach to identify the conceptions held by individuals and the meanings they make of their experiences. One teacher involved in the experiment questioned past method of using memorization when she asked, ‘what competences are we going to teach? Or give students? When individuals forget memorized knowledge, what will remain and be used to resolve problems? In addition to content knowledge, I should help students develop positive attitudes, process skills, the ability to make judgments, to link knowledge to daily life, and to learn how to learn through inquiry activities.

Smart, K., & Csapo, N. (Dec. 2007). Learning by doing: engaging students through learner-centered activities. *Business Communication Quarterly,* 451-457. Retrieved from ERIC.

The authors of this article describe how teachers are adapting new strategies to involve students actively in the learning process. The authors also describe in detail the “active learning” instructions in which students are more involved as they do more hands-on activities. They explain that students learn best when they take an active role and practice what they have learned. They also provide an interactive activity for teachers to implement active learning in the classroom.

Wrenn, J., & Wrenn, B. (2009). Enhancing learning by integrating theory and practice. *International Journal of Teaching and Learning in Higher Education, 21 (2),* 258-265. Retrieved from ERIC.

Wrenn and Wrenn write about the importance of solid grounding in theory in order to achieve professional practice. The article brings attention to professional programs for teachers which can enable them to be professional practitioners. The authors of this article also point out that the real life experience is the best teacher but it can provide a rich learning environment when combined with classroom practices. The teacher that brings his/her personal experience in the classroom makes children more engaged. They can see the teacher as the model who has been in a situation similar to the one they are in now. Students in the active learning class are more involved in higher order thinking as they develop critical thinking.

Dewey, J. (2008). Democracy and education. Virginia: Wilder Publications.

This book is a great source for inquiry-based theories and why teachers should put these theories into practice as they teach in the classroom. In this book Dewey writes about formal and informal education. The biggest challenge that philosophy of education has to face is how to keep the balance between the informal and formal education. He also points out the importance of education to social life. Education is important to social life as much as nutrition and reproduction is important to physiological life. Dewey also writes about the importance of play in school. Children get more motivated for school when they have a chance to engage in a physical activity. He advocates that children should be allowed to explore, and manipulate tools and materials. These activities can reduce the gap between life in school and life out of school.

Eshach, H. (1997). Inquiry-events as a tool for changing science teaching efficacy belief of kindergarten and elementary school teachers. *Journal of Science Education and Technology, 12*, 495-501. Retrieved from JSTOR. <http://www.jstor.org/stable/40188754>

This journal is based on a study conducted to improve teachers’ efficacy belief towards science teaching from the prospective of both the teachers’ needs as well as the child’s needs by using an approach known as the “Inquiry Events” teaching methods. This method involves responding to open ended situations in real life. It encourages investigation of a variety of issues which encourages the teacher to introduce scientific questions which they would ordinarily omit. The author posits that elementary grades have been cited as the weak point of science education. Many teachers believe that they are lacking in science content and therefore do not feel confident in teaching science.

The author has found that ‘Inquiry Events’ is a highly efficient teaching method. This method provides for the use of the most stimulating science activities which require the use of problem solving skills. They have also found sufficient evidence to prove that teachers’ belief system towards science teaching can be significantly and effectively changed in a short period of time. The study also showed that the “Inquiry Events” can contribute significantly towards the development of children’s cognitive skills. The teachers participating in the study agreed that the greatest potential of the “Inquiry Events” is to introduce science to a child as an ‘integral part of life and not an isolated problem’. The author bases the consistence of this claim on Dewey’s approach to the teaching process, ‘which requires taking into consideration the psychological needs of the child rather than introducing science as a logical coherent subject’.